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Appl. No. : 10/664,891 Confirmation No. 4267
Applicant : SHIGA, K. et al.
Filed : September 22, 2003
**Title : STORAGE NETWORK MANAGEMENT
SYSTEM AND METHOD**
TC/AU : 2153
Examiner : TBA
Docket No. : ASA-1157
Customer No.: 24956

**PETITION TO MAKE SPECIAL
UNDER 37 CFR §1.102(d) (MPEP §708.02(VIII))**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

The Applicants petition the Commissioner to make the above-identified application special in accordance with 37 CFR §1.102(d). In support of this Petition, pursuant to MPEP § 708.02(VIII), Applicants state the following.

(A) REQUIRED FEE

This Petition is accompanied by the fee set forth in 37 CFR § 1.117(h). A Credit Card Payment Form in the amount of \$130 accompanies this Petition in satisfaction of the fee. The Commissioner is hereby authorized to charge any

additional payment due, or to credit any overpayment, to Deposit Account No. 50-1417.

(B) ALL CLAIMS ARE DIRECTED TO A SINGLE INVENTION

Claims 1-13 are pending in the application. All the pending claims of the application are directed to a single invention. If the Office determines that all claims in the application are not directed to a single invention, Applicant will make election without traverse as a prerequisite to the grant of special status.

The claimed invention, as embodied in independent claims 1 and 9-13 is generally directed to facilitating LUN masking and the configuration of a VLAN in a system having a storage device. Under claim 1, the invention is a management apparatus for managing a storage network having a computer, a storage device and a switch, comprising: a controller, an interface connected to said switch and an input interface to be used by an administrator, wherein when said computer or said storage device is connected to said switch: based on information of first and second identifiers of said computer or said storage device acquired via said interface from said computer or said storage device connected to said switch, information of a correspondence relation acquired from said switch via said interface between said second identifier of said computer or said storage device connected to said switch, and a third identifier for identifying an interface of said switch connected to said computer or said storage device, and information regarding said first identifier for identifying said computer or said storage device constituting a predetermined group

entered by said administrator via said input interface, said third identifier of said switch belonging to said predetermined group is specified; and in response to inputting of information of a storage area of said storage device and information regarding said first identifier of said computer which can use said storage area, from said input interface, the input information is sent to said storage device to instruct security configuration, information of said third identifier of said switch corresponding to said first identifier and information of said predetermined group to which said third identifier belongs is derived, and the derived information is sent to said switch to instruct configuration of a virtual LAN corresponding to said predetermined group.

Additionally, under independent claim 9, the invention is a switch connectable to a computer and a storage device, comprising: a controller, an interface connected to said storage device or said computer and an input interface to be used by an administrator, wherein when said computer or said storage device is connected to said interface: in accordance with information of first and second identifiers of said computer or said storage device acquired via said interface from said computer or said storage device connected, information of a correspondence relation possessed by said switch between said second identifier of said computer or said storage device connected to said switch, and a third identifier for identifying an interface of said switch connected to said computer or said storage device, and information regarding said first identifier for identifying said computer or said storage device constituting a predetermined group entered by said administrator via said input interface, said controller identifies said third identifier corresponding to said computer

or said storage device belonging to said predetermined group; and in response to inputting of information of a storage area of said storage device and information regarding said first identifier of said computer which can use said storage area, from said input interface, input information is sent to said storage device to instruct security configuration, information of said third identifier corresponding to said first identifier and information of said predetermined group to which said third identifier belongs is derived, a virtual LAN corresponding to said predetermined group is configured.

Furthermore, under independent claim 10, the invention is a storage device connectable to a switch connected to a computer, comprising: a controller, an interface connected to said switch, an input interface to be used by an administrator and a storage area, wherein when said computer is connected to said switch: based on information of first and second identifiers of said computer acquired via said interface from said computer connected, information of a correspondence relation acquired from said switch via said interface between said second identifier of said computer connected to said switch and a third identifier for identifying said interface of said switch connected to said computer, and information regarding said first identifier for identifying said computer constituting a predetermined group entered by said administrator via said input interface, said third identifier corresponding to said computer belonging to said predetermined group is identified; and in response to inputting of information of said storage area and information regarding said first identifier of said computer which can use said storage area, from said input interface,

security configuration is performed, information of said third identifier corresponding to said first identifier and information of said predetermined group to which said third identifier belongs is derived, and said switch is instructed to configure a virtual LAN corresponding to said predetermined group.

In addition, under independent claim 11, the invention is a management method for managing a storage network having a computer, a storage device and a switch, comprising the steps of: when said computer or said storage device is connected to said switch: based on information of first and second identifiers of said computer or said storage device acquired from said computer or said storage device connected to said switch, information of a correspondence relation acquired from said switch between said second identifier of said computer or said storage device connected to said switch, and a third identifier for identifying an interface of said switch connected to said computer or said storage device, and information regarding said first identifier for identifying said computer and said storage device constituting a predetermined group, specifying said third identifier corresponding to said computer or said storage device belonging to said predetermined group; and based on information of a storage area of said storage device and information regarding said first identifier of said computer which can use said storage area, performing security configuration by said storage device, extracting information of said third identifier corresponding to said first identifier and information of said predetermined group to which said third identifier belongs, and creating through said switch a virtual LAN corresponding to said predetermined group.

Also, under independent claim 12, the invention is a management method for a storage system having a storage device, a switch and a computer respectively connected by a network, comprising the steps of: based on an identifier of a storage area of said storage device and a first address of said computer, performing access control configuration relative to the identifier of said storage area for said storage device; and converting the first address of said computer into a second address, converting the second address of said computer into an identifier of a port of said switch connected to said computer, and adding the identifier of said port to a virtual LAN for said switch.

Finally, under independent claim 13, the invention is a management method for a storage system having a storage device, a switch and a computer respectively connected by a network, comprising the steps of: based on an identifier of a storage area of said storage device and a first address of said computer, performing access control configuration for said computer relative to said storage area by said storage device; and converting the first address of said computer into a second address, converting the second address of said computer into an identifier of a port of said switch connected to said computer, and adding the identifier of said port to a virtual LAN for said switch.

(C) PRE-EXAMINATION SEARCH

A careful and thorough pre-examination search has been conducted, directed to the invention as claimed. The pre-examination search was conducted in the following *US Manual of Classification* areas:

<u>Class</u>	<u>Subclass</u>
709	217, 218, 220, 222, 223, 225, 230, 250

Additionally, a keyword search was conducted on the USPTO's EAST database, including US patents, published US patent applications, and the European and Japanese patent abstract databases. Additional searches for relevant art were conducted on the European Patent Office's ESPACENET database and the Association for Computing Machinery databases.

**(D) DOCUMENTS DEVELOPED BY THE PRE-EXAMINATION SEARCH AND
OTHER ART OF RECORD IN THE CASE**

The documents located by the pre-examination search are listed below. These documents were made of record in the present application by the Information Disclosure Statements filed April 1, 2005 and October 31, 2003.

<u>Document No.</u>	<u>Inventor</u>
US 20030069972	Yoshimura, Yutaka et al.
US 20030085914	Takaoka, Nobumitsu et al.
US 20030101239	Ishizaki, Takeshi
US 20030131105	Czeiger, Moshe et al.
US 20030229690	Kitani, Makoto et al.

Additionally, the following documents were made of record in the present application by the Information Disclosure Statements filed October 31, 2003, and September 19, 2003.

<u>Document No.</u>	<u>Inventor</u>
US 20030085914	Takaoka, Nobumitsu et al.
JP 2003-141055	Takaoka, Nobumitsu et al.
JP 2001-53776	Abe, Michiko

Because all of the above-listed documents are already of record in the present application, in accordance with MPEP § 708.02(VIII)(D), additional copies of these documents have not been submitted with this Petition.

(E) DETAILED DISCUSSION OF THE REFERENCES

Those of the above-listed documents deemed to be most closely-related to the present matter encompassed by the claims are discussed below, pointing out, with the particularity required by 37 CFR 1.111 (b) and (c), how the claimed present matter is patentable over the teachings of these documents.

1. Discussion of the Invention

The present invention relates to facilitating LUN masking and the configuration of a VLAN in a system having a storage device connected to a network and at least one computer. (See, e.g., the specification of the present application at page 10, line 18, through page 11, line 11.) A feature of the invention, as set forth in independent claims 1, 9 and 10, resides in that, in response to inputting of information of a

storage area of the storage device, and information regarding the first identifier of the computer which can use the storage area, the input information is sent to the storage device to instruct security configuration, information of the third identifier corresponding to the first identifier and information of the predetermined group to which the third identifier belongs is derived, and a virtual LAN corresponding to the predetermined group is configured.

Similarly, as set forth in claim 11, a feature of the invention includes the steps of, based on information of a storage area of the storage device and information regarding the first identifier of the computer which can use the storage area, performing security configuration by the storage device, extracting information of the third identifier corresponding to the first identifier and information of the predetermined group to which the third identifier belongs, and creating through the switch a virtual LAN corresponding to the predetermined group.

Further, as set forth in claims 12 and 13, a feature of the invention is a management method for a storage system including the steps of, based on an identifier of a storage area of the storage device and a first address of the computer, performing access control configuration for the storage device; and converting the first address of the computer into a second address, converting the second address of the computer into an identifier of a port of the switch connected to the computer, and adding the identifier of the port to a virtual LAN for the switch. The prior art does not teach or suggest these features in combination with the other limitations of claims 1 and 9-13.

2. Discussion of the References Believed to be Most-Closely Related

Published US Patent Application No. US 20030069972, to Yoshimura et al., shows a computer resource allocating method that includes preparing a user identification table, VPN, VLAN, and storage network configuration definition tables that are managed by a managing server. User-dedicated VLANs are configured for each user, and may include the allocation of servers and LUNs. The load of each of server is monitored and an allocation change, such as a dynamic change of the VLAN, may be made based upon the monitored load. (See, e.g., Abstract, paragraphs 10-12 and 48-66.) Thus, Yoshimura is concerned with allocating resources, and does not teach the present invention in which input information is sent to a storage device to instruct security configuration, and derived information is sent to a switch to instruct configuration of a virtual LAN. Accordingly, Yoshimura does not teach that, in response to inputting of information of a storage area of the storage device, and information regarding the first identifier of the computer which can use the storage area, the input information is sent to the storage device to instruct security configuration, and information of the third identifier corresponding to the first identifier and information of the predetermined group to which the third identifier belongs is derived, a virtual LAN corresponding to the predetermined group is configured, as set forth in claims 1, 9, and 10. Neither does Yoshimura teach a method that includes the steps of, based on information of a storage area of the storage device and information regarding the first identifier of the computer which can use the storage area, performing security configuration by the storage device,

extracting information of the third identifier corresponding to the first identifier and information of the predetermined group to which the third identifier belongs, and creating through the switch a virtual LAN corresponding to the predetermined group, as set forth in claim 11. Further, Yoshimura does not teach a management method for a storage system including the steps of, based on an identifier of a storage area of the storage device and a first address of the computer, performing access control configuration for the storage device; and converting the first address of the computer into a second address, converting the second address of the computer into an identifier of a port of the switch connected to the computer, and adding the identifier of the port to a virtual LAN for the switch, as set forth in claims 12 and 13.

Published US Patent Application No. US 20030085914, to Takaoka et al., (US equivalent of JP 2003-141055) shows a storage network in which access restriction methods are applied. A utility program includes a display for verifying the relationship of connections between a switch unit, storage devices, and computers. The system includes a management computer with a console, a storage device having an LUN security function, a fabric switch, and a computer using the storage device. (See, e.g., Abstract, and paragraphs 14-17 and 46-67.) Thus, Takaoka is directed to the display, management, and possible reconfiguration of states of connections between computers and storage means, such as the setting of an LUN security configuration, but Takaoka does not teach the present invention, including how to configure a VLAN in conjunction with security configuration of a storage

device. Accordingly, Takaoka does not teach that, in response to inputting of information of a storage area of the storage device, and information regarding the first identifier of the computer which can use the storage area, the input information is sent to the storage device to instruct security configuration, and information of the third identifier corresponding to the first identifier and information of the predetermined group to which the third identifier belongs is derived, a virtual LAN corresponding to the predetermined group is configured, as set forth in claims 1, 9, and 10. Neither does Takaoka teach a method that includes the steps of, based on information of a storage area of the storage device and information regarding the first identifier of the computer which can use the storage area, performing security configuration by the storage device, extracting information of the third identifier corresponding to the first identifier and information of the predetermined group to which the third identifier belongs, and creating through the switch a virtual LAN corresponding to the predetermined group, as set forth in claim 11. Further, Takaoka does not teach a management method for a storage system including the steps of, based on an identifier of a storage area of the storage device and a first address of the computer, performing access control configuration for the storage device; and converting the first address of the computer into a second address, converting the second address of the computer into an identifier of a port of the switch connected to the computer, and adding the identifier of the port to a virtual LAN for the switch, as set forth in claims 12 and 13.

Published US Patent Application No. US 20030101239, to Ishizaki, shows secure IP-protocol-capable storage devices with VLAN support. A storage controller is coupled with at least one of a plurality of storage devices. A network interface connectable to a VLAN switch provides connectivity. The storage apparatus is operable to control the VLAN switch to map at least one of a plurality of segments of a VLAN to at least one of a plurality of virtual volumes of the storage devices based upon configuration information. In specific embodiments, the VLAN access links may be identified by MAC address. Additionally, the method can include updating a physical network IP address, updating a VLAN interface IP address and VLAN tag, deleting a designated VLAN interface, and adding a new VLAN interface. (See, e.g., Abstract and paragraphs 5-18 and 63-86.) Thus, while Ishizaki teaches a method and apparatus for a VLAN, including a VLAN switch and a secure storage apparatus, Ishizaki does not teach configuring a secure storage device in response to inputting of information of a storage area of the storage device and information regarding a first identifier of a computer which can use the storage area, as taught by the present invention. Accordingly, Ishizaki does not teach that, in response to inputting of information of a storage area of the storage device, and information regarding the first identifier of the computer which can use the storage area, the input information is sent to the storage device to instruct security configuration, and information of the third identifier corresponding to the first identifier and information of the predetermined group to which the third identifier belongs is derived, a virtual LAN corresponding to the predetermined group is configured, as set forth in claims 1, 9,

and 10. Neither does Ishizaki teach a method that includes the steps of, based on information of a storage area of the storage device and information regarding the first identifier of the computer which can use the storage area, performing security configuration by the storage device, extracting information of the third identifier corresponding to the first identifier and information of the predetermined group to which the third identifier belongs, and creating through the switch a virtual LAN corresponding to the predetermined group, as set forth in claim 11. Further, Ishizaki does not teach a management method for a storage system including the steps of, based on an identifier of a storage area of the storage device and a first address of the computer, performing access control configuration for the storage device; and converting the first address of the computer into a second address, converting the second address of the computer into an identifier of a port of the switch connected to the computer, and adding the identifier of the port to a virtual LAN for the switch, as set forth in claims 12 and 13.

Published US Patent Application No. US 20030131105, to Czeiger et al., shows a method for transferring information between a first network operating under Ethernet protocol and a second network operating under a Fibre Channel protocol. The stations located in the first network are grouped into VLANs that use MAC identifiers for identifying source and destination addresses. (See, e.g., Abstract and paragraphs 10 and 57-61.) Thus, Czeiger is directed to inter-network communications between an FC network and an Ethernet network, and does not

teach the present invention, including a system or method wherein input information is sent to a storage device to instruct security configuration. Accordingly, Czeiger does not teach that, in response to inputting of information of a storage area of the storage device, and information regarding the first identifier of the computer which can use the storage area, the input information is sent to the storage device to instruct security configuration, and information of the third identifier corresponding to the first identifier and information of the predetermined group to which the third identifier belongs is derived, a virtual LAN corresponding to the predetermined group is configured, as set forth in claims 1, 9, and 10. Neither does Czeiger teach a method that includes the steps of, based on information of a storage area of the storage device and information regarding the first identifier of the computer which can use the storage area, performing security configuration by the storage device, extracting information of the third identifier corresponding to the first identifier and information of the predetermined group to which the third identifier belongs, and creating through the switch a virtual LAN corresponding to the predetermined group, as set forth in claim 11. Further, Czeiger does not teach a management method for a storage system including the steps of, based on an identifier of a storage area of the storage device and a first address of the computer, performing access control configuration for the storage device; and converting the first address of the computer into a second address, converting the second address of the computer into an identifier of a port of the switch connected to the computer, and adding the identifier of the port to a virtual LAN for the switch, as set forth in claims 12 and 13.

Published US Patent Application No. US 20030229690, to Kitani et al., shows a secure storage system for securely accessing a storage device on a network by a client having VPN capability. A management apparatus is included for managing the storage device by means of a logical volume assigned to the storage device. A conversion apparatus converts the protocol used for the storage device and the protocol used for the VPN. A mapping means is also included for storing a VPN allocated to the client and an access range of the storage device corresponding to the VPN. (See, e.g., Abstract and paragraphs 14-19 and 50-63.) However, Kitani does not teach a system or method wherein input information is sent to a storage device to instruct security configuration, as in the present invention. Accordingly, Kitani does not teach that, in response to inputting of information of a storage area of the storage device, and information regarding the first identifier of the computer which can use the storage area, the input information is sent to the storage device to instruct security configuration, and information of the third identifier corresponding to the first identifier and information of the predetermined group to which the third identifier belongs is derived, a virtual LAN corresponding to the predetermined group is configured, as set forth in claims 1, 9, and 10. Neither does Kitani teach a method that includes the steps of, based on information of a storage area of the storage device and information regarding the first identifier of the computer which can use the storage area, performing security configuration by the storage device, extracting information of the third identifier corresponding to the first identifier and information of

the predetermined group to which the third identifier belongs, and creating through the switch a virtual LAN corresponding to the predetermined group, as set forth in claim 11. Further, Kitani does not teach a management method for a storage system including the steps of, based on an identifier of a storage area of the storage device and a first address of the computer, performing access control configuration for the storage device; and converting the first address of the computer into a second address, converting the second address of the computer into an identifier of a port of the switch connected to the computer, and adding the identifier of the port to a virtual LAN for the switch, as set forth in claims 12 and 13.

The Japanese patent to Abe, JP 2001-53776, as also discussed in the specification of the present application at page 3, shows a network system that does not require that a VLAN definition be changed when a terminal device is moved, added or eliminated. When a terminal device is moved from a first switch to a second switch, the second switch detects that the terminal device is not registered for the second switch. The second switch inquires a server and receives a frame transmitted from terminal device. The second switch compares the received frame with a VLAN definition table. The server detects that the terminal device was moved from the first switch and the VLAN belonging there is detected and the result is imparted to the second switch. The second switch receives the results and changes its VLAN definition table to register the terminal device. Thus, Abe discloses a method to automatically reconfigure a VLAN when a switch to which a computer is

connected is changed. However, Abe does not teach a system by which a VLAN may be configured when a storage system is configured for security in the system. Accordingly, Abe does not teach that, in response to inputting of information of a storage area of the storage device, and information regarding the first identifier of the computer which can use the storage area, the input information is sent to the storage device to instruct security configuration, and information of the third identifier corresponding to the first identifier and information of the predetermined group to which the third identifier belongs is derived, a virtual LAN corresponding to the predetermined group is configured, as set forth in claims 1, 9, and 10. Neither does Abe teach a method that includes the steps of, based on information of a storage area of the storage device and information regarding the first identifier of the computer which can use the storage area, performing security configuration by the storage device, extracting information of the third identifier corresponding to the first identifier and information of the predetermined group to which the third identifier belongs, and creating through the switch a virtual LAN corresponding to the predetermined group, as set forth in claim 11. Further, Abe does not teach a management method for a storage system including the steps of, based on an identifier of a storage area of the storage device and a first address of the computer, performing access control configuration for the storage device; and converting the first address of the computer into a second address, converting the second address of the computer into an identifier of a port of the switch connected to the computer,

and adding the identifier of the port to a virtual LAN for the switch, as set forth in claims 12 and 13.

CONCLUSION

Thus, from the foregoing, it is apparent that none of the above-discussed documents teach the storage system of the invention, including that, in response to inputting of information of a storage area of the storage device, and information regarding the first identifier of the computer which can use the storage area, the input information is sent to the storage device to instruct security configuration, information of the third identifier corresponding to the first identifier and information of the predetermined group to which the third identifier belongs is derived, a virtual LAN corresponding to the predetermined group is configured, as set forth in claims 1, 9, and 10. Nor do the above-discussed documents teach the steps of, based on information of a storage area of the storage device and information regarding the first identifier of the computer which can use the storage area, performing security configuration by the storage device, extracting information of the third identifier corresponding to the first identifier and information of the predetermined group to which the third identifier belongs, and creating through the switch a virtual LAN corresponding to the predetermined group, as set forth in claim 11. Neither do the above-discussed documents teach a management method for a storage system including the steps of, based on an identifier of a storage area of the storage device and a first address of the computer, performing access control configuration for the

storage device; and converting the first address of the computer into a second address, converting the second address of the computer into an identifier of a port of the switch connected to the computer, and adding the identifier of the port to a virtual LAN for the switch, as set forth in claims 12 and 13. Accordingly, independent claims 1 and 9-13 are patentable over the above-listed documents.

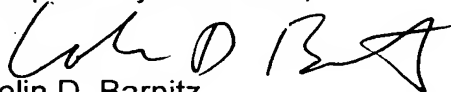
The Applicants submit that the foregoing discussion demonstrates the patentability of the independent claims over the closest-known prior art, taken either singly, or in combination. The remaining claims depend from the independent claims, claim additional features of the invention, and are patentable at least because they depend from allowable base claims. Accordingly, the requirements of 37 CFR §1.102(d) having been satisfied, the Applicants request that this Petition to Make Special be granted and that the application be examined according to prescribed procedures set forth in MPEP §708.02 (VIII).

The Applicants prepared this Petition in order to satisfy the requirements of 37 C.F.R. §1.102(d) and MPEP §708.02 (VIII). The pre-examination search required by these sections was "directed to the invention as claimed in the application for which special status is requested." MPEP §708.02 (VIII). The search performed in support of this Petition is believed to be in full compliance with the requirements of MPEP §708.02 (VIII); however, Applicants make no representation that the search covered every conceivable search area that might contain relevant prior art. It is always possible that prior art of greater relevance to the claims may exist. The Applicants urge the Examiner to conduct his or her own complete search of the prior art, and to

thoroughly examine this application in view of the prior art cited above and any other prior art that may be located by the Examiner's independent search.

Further, while the Applicants have identified and discussed certain portions of each cited reference in order to satisfy the requirement for a "detailed discussion of the references, which discussion points out, with the particularity required by 37 C.F.R. §1.111(b) and (c), how the claimed present matter is patentable over the references" (MPEP §708.02(VIII)), the Examiner should not limit review of these documents to the identified portions, but rather is urged to review and consider the entirety of each reference.

Respectfully submitted,



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